Accelerator Systems Division Highlights for the Week Ending November 22, 2002

ASD/LANL: Warm Linac

HIGH-POWER RF (WBS 1.4.1.1)
Accomplishments this week: (1) Joe Bradley worked at the SNS site to support production of first high-power RF from the RFQ klystron on Nov 21; (2) the first CCL 5-MW klystron passed factory acceptance test at Thales - tests included a successful heat run at 5.9 MW at 50 Hz and 0.55 ms pulsewidth for 24 hours; (3) the seventh RFQ/DTL 2.5-MW klystron passed factory acceptance tests at Marconi (E2V) and the sixth has been shipped; (4) the sixth SRF klystron passed factory acceptance tests. Tube no. 5 (whose window broke its window in initial factory tests) was repaired and is ready for retesting at CPI. Tube no. 1 (which lost alignment during initial tests at CPI) was rebuilt to specification.
Concerns & actions: (1) Recent changes implemented on RFQ/DTL transmitters installed at the SNS have put vendor warranties at risk. Vendor observed field changes without adequate documentation, consultation, and communication with LANL or vendor. We notified ASD and recommended specific procedures and practices that may mitigate risk and restore warranty; (2) Full acceptance of the 5-MW CCL klystron awaits testing after delivery in Dec to LANL (factory did not have a test stand that could reach full specifications); (3) Circulators arriving at ORNL are poorly packaged and/or handled in shipment. We will visit factory in Dec to discuss consequences and to obtain commitment for improved packaging, handling, and shipping.

HIGH-VOLTAGE POWER CONDITIONING (WBS 1.4.1.2)
Accomplishments: (1) Bill Reass was at the SNS site to support first operation of the RFQ klystron with the production HV converter modulator (HVCM); (2) Reass presented a seminar on the HVCM System at the SNS Project Director's Technical Forum; (3) Reass was at Dynapower to provide QA and observe factory acceptance tests on the second production HVCM. It reached 140 kV and 9.1 MW (full power for the 5 MW klystron) in short, low rep-rate pulses. A 'heat run' at this level was begun and approximately 11 hours of successful operation achieved.
Concerns & Actions: (1) Mechanical inspection at Dynapower of latest 140-kV HVCM cast transformers let us to suspect voids and poor adhesion on the inner surfaces of approximately 3 (of 10) of the secondary windings. Sectioning of one confirmed poor adhesion. An improved winding/casting fixture is being developed, while non-destructive testing (electrical or ultrasound) of existing transformers is being considered. Voids and de-lamination were not observed in earlier sectioning tests on the lower voltage transformers such as that used on the RFQ/DTL1/DTL2 modulator.

DRIFT-TUBE LINAC (WBS 1.4.2)
Accomplishments: (1) Fabrication of the 40 remanufactured tank 1 drift tubes has begun - test articles for quality assurance tests have been added to the DT production stream; (2) successful ring repair methods (using rings of greater cross-section) to the steeper tank 3 drift tube noses were demonstrated. The repaired areas "cleaned up" with a very good finish and no evidence of the weld crater; (3) process drawings for first fabrication stage of the tank 4, 5 & 6 drift tubes were completed; (4) a 2-D magnetostatic model was created to develop a field clamp to suppress stray fields near the outer edge of drift tubes containing permanent magnet quadrupoles. Field clamp was built and used for the development of the water-channel e-beam weld repair; (5) a 3-D magnetostatic model was created to develop a field clamp to suppress the fringe fields near the bore of drift tubes containing permanent magnet quadrupoles. This field clamp is being used to develop a bore-tube e-beam weld repair procedure; (6) good quality and controlled DT bore tube electron-beam weld adjacent to a PMQ has been demonstrated at ESCO (formerly ISYS) using magnetic field shunts - trial drift tube end cap to body electron beam welds were less successful due to inadequate magnetic field shunting; (7) sectioning of four tank 1 drift tubes in the diverter to sleeve braze joint has been completed and the specimens sent to LTI for etching, photomicrographs, and metallography; (8) a work order was placed with LLNL for development and qualification of EMD DT electron beam welding processes – they made initial welds trials on coupons; (8) we transmitted a request for quotation for weld repair services for tank 2 and 3 DT's to ESCO.
Concern & actions: Adequate electron-beam welding of the tank 1 drift tube cap to body sleeve weld remains to be demonstrated. The use of a magnetic field shunting design similar to that used to effect the DT bore tube weld will likely be successful. Additional tank 1 DT welding and magnet field shunting trials will be performed next week at ESCO.

COUPLED-CAVITY LINAC (WBS 1.4.4)
Accomplishments: (1) ACCEL completed internal cells for segments 1-6 of module 1 – they are ready for stack tuning and brazing; (2) segments 7-12 have been septum brazed and are in final machining; (3) segment endwalls using the revised machining process and fixtures are expected from Mechanik Center this week. Stack brazing will commence at ACCEL as soon as endwalls are available - at least 5 stack-brazed segments are planned to be available for tuning during the December 16-20 ACCEL/LANL/ASD site meeting at ACCEL; (4) decision was made to incorporate a pressurized helium test of the water cooling channels of the completed segments at ACCEL. The test will replace the originally specified 10 bar hydrostatic test and will be performed on each completed segment before final tuning. A test procedure is being prepared by ACCEL for LANL/ORNL review; (5) LANL modified production drawings to incorporate the conflat-style rectangular flange into the bridge coupler - transition section joint. This seal system has been used for a similar waveguide joint on Cornell cavities built by ACCEL with no problems in service. A design modification to this style was discussed and accepted in January 2002, pending tests by ACCEL; tests were completed with excellent results. LANL has modified the production drawings to represent the geometry tested and a formal change order is in process with the LANL procurement team. The revised geometry may be seen in LANL drawing 155Y513212/C available through the DCC; (7) Modified procedures were developed for tuning the CCL bridge couplers. A new section was subsequently written for the tuning plan which the ACCEL will follow in tuning all 44 bridge couplers.
Concern & actions: (1) we received a request from ORNL to revisit the design of the segment-bridge coupler flange seal to determine what impact would occur if an all- metal seal similar to the Fermi-Lab Bridge Side Couple seal (0230-MB-300077/B) were used. We will prepare a formal response by Dec 6; (2) ACCEL encountered difficulty in obtaining "keensert" stainless steel inserts in English System dimensional sizes for the copper as required for attachment of cooling lines etc - LANL will purchase and ship them inserts and installation tools.

LINAC PHYSICS (WBS 1.4.5)
Accomplishments: (1) The *Poisson-Superfish* code group was converted to compile under Fortran-95. The compiled code is more efficient. Soon the source can be compiled to execute under the LINUX operating system without modification; (2) individual particle phases were added to the *Parmila* plot file to facilitate studies of the energy corrector cavity.

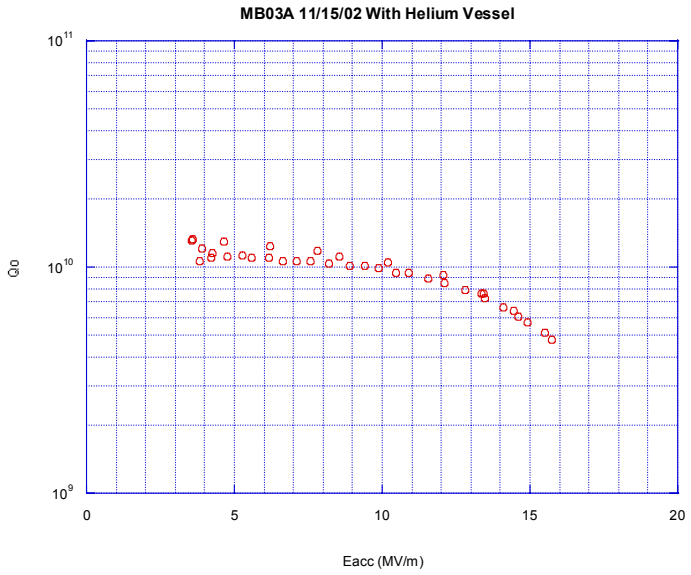
ASD/JLAB: Cold Linac

Five vertical and two horizontal sections of the LN_2 transfer line are complete, on schedule for January delivery to SNS.

The replacement klystron for the 1 MW RF test stand has been received at JLab. It has been installed in the modulator. Commissioning is underway.

The prototype medium-β cryomodule has been shipped to ORNL for service as a spare.

Production cavities MB01 and MB03 have been qualified for string assembly. See Figure.



ASD/BNL: Ring

Braze samples (ss/cu) were received from BINP for BNL analysis and approval.

In our weekly teleconference with SDMS, we have been advised that the HEBT collimators (x and y) will be shipped to SNS/OR by the end of April 2003.

IPM - There is some concern that the Project Office will not approve the PCR for electromagnets; design effort will shift to the detector and vacuum chamber until the electromagnet situation is clarified.

Preparations continue for testing the laser wire scanner at 750KeV.

An RFQ for the large aperture 26S26 high field chromaticity sextupoles has been released. Bids are due back in early December.

All Ring dipole magnets have been shimmed, measured and accepted. Additional work for 3D mapping of a typical end field is under study.

Production plans and schedules are being reviewed for half-cells #2, 3 and 4.

Test plans for magnetic measure and shimming of the remaining production magnets are being reviewed. This includes quads, correctors and kicker magnets.

Chicane #4 (NETC) is being s/u for acceptance testing.

27CDM30 - Testing of the production first article was completed yesterday.

Assembly of half-cell #2 has begun.

Pictures of the RF Tuning PS that is being constructed at Danfysik are attached.

Controls

Timing hardware and software for the MEBT bunchers and the RFQ high-power and LLRF IOCs was installed and checked out.

Timing software to support the front-end MPS system is ready for installation on site. A new Timing Master screen was installed at the site. This screen incorporates timing for the ion source, the high-power RF, the low-level RF, the LEBT chopper, and the diagnostic gates.

MPS systems have been installed in the RFQ_HPRF:IOC1, FE_CTL:IOC2 and FE_VAC:MIOC1A,1B. A few inputs have been connected. Essential inputs need to be added to the Vacuum ION, and EPS PLC. With the first RF Converter-Modulator on and pulsing above 100 kV noise is a problem for MPS as well as the timing system. Measurements will be made as HV testing on the RFQ_HPRF proceeds. MPS will not be connected to the shutdown equipment in the front end until the noise problems are understood and resolved.

This week for the first time we ran the converter modulator with PLC, IOC and archiver all operating. Below is an archived plot of the modulator at about 64kV for about 1hr 40 mins.

Fabrication and checkout of the Central Helium Liquefier Main 4.5 K cold box PLC rack was completed at the DCS facility. This rack is to be shipped to the site and installed on the platform above the 4.5 K cold box. This completes the procurement of ICS control racks for the CHL Building. Additional control system equipment and wiring will be installed in the racks after they are anchored in place. The CHL Controls Racks have been moved into the CHL Control Room. (See below.)

Conversion of Front End screens to the site standard EDM display manager was completed.

Last week the final shipment of PSC and PSI modules were tested at BNL. This shipment was meant to include all the manufacturing, and test procedure enhancements accumulated since production began. Unfortunately, some steps were omitted, requiring minor local rework. Although no further orders are expected, a series of telephone conference have been held with the vendor to rectify the situation for any future purchases.

LANL was contacted and is being kept apprised of the situation so that items already shipped can be checked and either reworked at LANL or returned to the vendor for rework.

The majority of the effort on the Personnel Protection System (PPS) this week involved modifying the PPS system in anticipation of phase 0.0 (front end). This involved wiring up the PPS interfaces to the high power RF and the

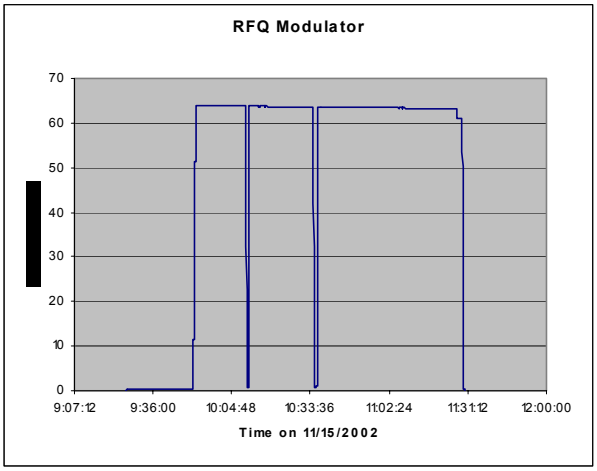
MEBT rebuncher RF systems. New fuses and contactors were installed for the 480 VAC supply to the plasma RF supply. The remaining testing will be performed when we take the system down for re-certification for phase 0.0.

SvT is nearing completion of the design for the PPS phase I PLC equipment. The 90% design package is due next week.

D-Plate cabling information for the Emittance Control System was submitted.

New Conventional Facilities controls software from Sverdrup was integrated at the site.

At LANL documentation work continued, including signal lists for the SCL cavity tuners, transmitters, D-Plate RCCS and QMCS, as well as documents on the high-level XAL architecture, superconducting and warm vacuum systems and drawings for SCL/QMCS. Software development continued on the Beckhoff driver, RGA driver, EPICS gateway performance issues and power supply application. Support was provided to ORNL for the HPRF converter-modulator commissioning, and for the addition of the timing system to the LLRF system. Vacuum cables have been made and the power supply test rack is complete.



Installation

Accelerator Physics

Ten AP group members have been certified as Ion Source operators. Group members have been staffing 10 hour shifts on the Front-End for the past two weeks.

S. Kim has been investigating SC cavity mechanical deformations that give rise to cavity field tilts and external Q variations. He finds end-cell deformations in excess of 100 microns can give rise to noticeable field tilts and changes in external Q.

Operations Group

Ion Source Group

Over the past 2 weeks we trained and certified 19 ion source operators. Training consisted of starting up, HV conditioning, plasma conditioning, optimizing beam delivery on the flag attached to the ground electrode, and shutting down procedures. With about 3-4 full cycles per 5-hour shift, each operator went about 2-4 times through all procedures within a minimum of two shifts, before demonstrating his skills for certification.

During the training we found that the ion beam current can be increased by roughly 20% if the pressure is reduced to approximately 12 sccm, e.g. generating 30 mA with 25 kW power of 2 MHz. This allowed us to reduce the RF power by approximately 20% to generate the 20 or 25 mA beams required for commissioning. At lower pressures

the 2 MHz plasma sometimes does not start or breaks up after a few hundred microseconds. Normally such instabilities can be reduced by increasing the 13 MHz power and/or slightly raising the H pressure. These findings promise increased lifetime and reliability, both of which increase with decreasing RF power and H pressure. These results, however, could be coupled with an emittance growth, which would explain the apparently inconsistent behavior during the 5x24 and 7x24. Commissioning the MEBT will provide the final answer. Independent of the outcome, the finding provided an excellent opportunity to teach low-wear ion source operations.

The PPS system now controls the 13 MHz RF supply simultaneously with the 2 MHz supply, after the 13 MHz was rewired on 11-19. The rewiring changed stray capacitances and therefore received close attention. The source could not be restarted, even with a 2 s long 50-sccm puff and 500 W of 13 MHz. It took a 1s long 90 sccm puff to re-ignite the source, which became feasible after Carl Lionberger changed the control limits. This turned out to be a singular event, as all subsequent startups succeeded with the usual 1 s long 50 sccm puff and 200 W of 13 MHz.

Our effort to determine the delivered ion beam from the load currents of the extractor- and 65 kV supplies failed due to the high noise level observed with the current transducer on the 65 kV supply.

A water leak developed in the antenna matching network, shutting down operations for a few hours until the water hose was replaced. This leak appeared to be similar to a leak encountered a few weeks ago, and if reappears we will start a detailed investigation.

Mechanical Group

The o-ring grooves on the third DTL tank are being enlarged at Oak Ridge Tool and will be complete today.

A DRAFT schedule of the activities through conditioning of DTL tanks 1 and 3 has been generated and sent out for comment. Additional compression of the tank 1 schedule is required to meet the IPS date for installation and test of DTL-1 (May 21, 2003). This will be discussed and iterated next week.

Magnet Systems

Vacuum Systems

Linac HPRF

Ran with beamstick last week with following:
110 kV, 60 Hz for ~15 minutes total
120 kV, 60 Hz for <=1 minute (SCR average power ~250kW)

Dynapower regulator card mods worked very well; we can now regulate as low as
2 Hz at 500 V dc (~75 kV pulsed output). Rad techs performed x-ray mapping of beamstick; max radiation 6 mrem/hr on contact and 2 mrem/hr 30 cm away operating at 110 kV, 26 A, 60 Hz. We have lowered that dose rate since by strategically installing lead "bean bags" over opening in shielding near ion pump. Had several trips due to beamstick arcing (as evidenced by transmitter crowbaring from ion pump over current and voltage waveforms on scope). Tried to condition up higher, but without heat transfer in modulator tank, were reluctant to push further. Fixed oil pump problem and are now able to operate for longer durations. Tripped out HVCM on over temperature in deionized water loop. Problem was resolved when fans were turned on at the cooling tower to increase evaporation rate and therefore lower water loop temperature. Calibrated several readbacks from SCR and HVCM units. Ran yesterday (11/20) into RFQ klystron without RF and were able to condition the tube up to 115 kV at 60 Hz. Ran there for ~1 hour. Preparing operator training seminar for week after Thanksgiving.

Installed DTL3 and DTL4 klystrons. Swapped RFQ and DTL1 klystrons due to leak in plumbing on RFQ klystron. Installed cabling for RF Bldg. HPRF transmitters. Installed lead shielding for beamstick. Ran RFQ klystron to 800 kW into a waveguide short for a short duration (~10 minutes) before discovering arcing in vicinity of output window / transition section. Cleaning klystron output section and transition section to allow for operation next week.

Linac LLRF

ORNL

The team at Oak Ridge has spent much time in the Front End building and Klystron gallery the last two weeks preparing for the testing and commissioning of the RFQ. The RF Control chassis is installed in the Front End racks along with the four MEBT Rebuncher control chassis. It has been used to drive the RFQ using a 100 W amplifier. Open and closed-loop control has been demonstrated.

The High Power Protect Module (HPM) has been installed and tested. Its operation was confirmed during high power RF testing of the klystron on 11/23. Arcing in the waveguide was detected by the arc detector, and the HPM inhibited the RF drive as designed. One of the difficulties encountered in bringing the HPM into operation was incorrect jumper settings on some of the AFT arc detector boards. The consecutive fault protection feature will be implemented next week as an IOC application; in the long term, this feature will be implemented on the HPM.

There will be a design review the week of Dec. 16 for the new Field Control Module (FCM) presently under development.

Andrews Corp. has agreed to produce a foam-filled 3-1/8 inch rigid coaxial line if desired for the reference line.

LBNL

We completed a new chassis that will be used for development here in Berkeley. We also worked on the FPGA firmware, and are nearly done with the system testing that is needed to close the loop on a test cavity. The test system is installed and ready for closed loop operations.

We are also well along in the fabrication of two additional boards which will be used in the system under development.

A PCR to cover the initial effort (August-February) is in the works. This is needed to fund the scope that has been transferred to Berkeley.

Electrical Systems Group

The first 15 (of 360) corrector power supplies have been delivered to SNS and are being tested at the power supply test facility at RATS.

Ten CCL vacuum racks are being assembled for the vacuum group by the electrical services group. This includes component installation, intra-rack wiring, ac wiring, and documentation.

Tom Owens has submitted abstracts to the ASD office for on Ring LLRF system modeling and by a collaboration of ORNL Chemical Sciences Division, University of Tennessee, BNL and SNS on Long-Life Stripping Foil production and testing.

PPS cabling and testing in FE was completed this week

RFQ cable plant completed

Transmitter racks AC distribution is ready and waiting for Equipment Approval

CCL module 1 cable tray installation above CCL first rack row completed, first CCL rack base set in place

Survey and Alignment Group

JLAB

A representative from the Survey and Alignment group was out at J-LAB observing the fiducialization of the prototype cryomodule on November 5. One thing was noted that has been rectified for the remaining cryomodules. There are no ports on the prototype for accessing the reference flanges. As a result, the SNS Survey and Alignment has no way of verifying the alignment of the modules with respect to these reference flanges. We have to assume that alignment have been performed the alignment correctly. Our representative did take some measurements referencing the accessible flanges to the fiducials on the tank. This will allow us to determine if the internal components has moved while in transport. As stated earlier, this problem has been rectified by the addition of ports at the reference flanges.

Argonne

On Nov 07, Engineers from the Survey & Alignment Group met the Instrument Group at Argonne to discuss a number of issues including the fiducialization of neutron guides.

RATS

The fixture for the Magnet Measurement Group that will allow for precise placement of quadrupole magnets on the test stand is nearly complete. One modification needs to be performed to the fixture before installation. Installation should occur next week.

Cleaned fiducials on Half Cell and measured fiducials and flange centers for future comparison with BNL fiducialization data. Tested the viability of using the tracker hidden point routine on future components. This being potentially helpful as orientation of components are currently unknown.

Site

Continued mounting monument labels in Linac, will move into the HEBT and ring in the coming weeks. Currently, Linac is 75% complete.

Started mounting wall monuments in the Ring, approximately 30% complete, plan to complete all before Thanksgiving.

Continued with HEBT floor monument set out, now that the floor space is once again available. Plan on continuing into the RTBT with the intentions of having all floor monuments installed to the Target before Christmas.

Completed adjustment and checking of the precise floor monument elevation resurvey and began work on graphs showing the uneven subsidence (sides vs. center).

Inventoried linac floor monuments that have already been rendered difficult or impossible to use due to obstructions (12).

We analyzed more schemes for observing a temporary "precision" network in the ring to try to reduce the number of observations required.

We reviewed a site surveyor's data regarding the as-built position of the target bulk shield liner, and compared it to the more detailed as-built survey performed by Survey and Alignment in early September. The site surveyor's data did not show the out-of-tolerance condition due to the scarcity of shots.

Drawing Integration

Continued analyzing installation drawings recently received from BNL. Although these drawings are marked "preliminary", we have been assured that they are very close to the final "signed off" version. Due to the urgent need for these drawings, this use has been necessary.

Cryogenics Group

CHL: The piping contractor has started the south wall piping installation. The water piping connections to the compressors is complete, work continues on the gas piping. Work continues in the cold box area preparing the cold box room for leak testing and pressure testing of the cold box the week of December 02.

Tunnel: Welding of the 6" outer jacket continues on the east end of the supply transfer lines.

Transfer lines: Return module HB9/HB10 is completed and ready for shipping to the tunnel. Return Module MB1/MB2is 75% completed.

Cryomodules: The Medium Beta prototype has arrived and is in receiving testing. - Instruments checked out ok (continuity checks)

- Passband measurements were completed; these need to be compared to other measurements, but no surprises apparent.
- The vacuum check on the insulating vacuum indicated a substantial leak; currently there is a high helium background because of the shield leak, so we were not able to check flanges, etc. for a leak.
- The helium circuit was vented on arrival. Because of the insulating vacuum leak we were not able to pressurize and check this circuit.
- While filling the insulating vacuum with nitrogen (in order to perform passband measurements at 1 atm), the beamline vacuum deteriorated and the ion pump tripped. The insulating vacuum was re-established and the beam line vacuum improved. The nitrogen purge reduced the helium background.

JLAB: The recovery compressors have arrived. 5 horizontal and 2 vertical LN2 lines are completed and ready for shipment in January.

Beam Diagnostics

ORNL beam diagnostics report:

Laser profile monitor design is progressing very well. The optics box design is complete. The vacuum box design is complete. Kerry Potter (SNS-ORNL lead designer) asked Max Cronin (ORNL liaison) to put the drawings for bid. The bids are back. Kerry and Graeme Murdoch are evaluating the bids. We would like to have one system ready for the MEBT testing by the end of this year.

Craig Swanson has put together three diagnostic timing boards decoding the EL and
RTDL and dumping the RTDL frame and data to a file on the lab PC. Eric from the controls has confirmed that the RTDL frame and data are all correct. The CRC checks are
also working correctly. The analog circuitry can now be completely removed except for two transformers and comparators to allow the EL and RTDL data to be translated to a TTL signal, which is sent directly to the Altera FPGA. He will be shipping one board to LANL for more complex C++ code driver development in Labview. Matt Stettler wrote a number of test programs to test the decoder board during his stay at ORNL. We are thankful for his support.

Craig Deibele is designing filters and working with Jim Pogge on laser profile monitor electronics. Craig has also received the Fast Faraday Cup beam Box from Italy. He is working with Paul Gibson on MEBT mounting fixtures.

Wim and Matthew continued to develop LabView code to control stepper motors for BPM test stand and Laser Wire actuators. They have written the bulk of the VI to park the motor at the home position, re-did Initialization of board and motor axes. They have developed and improved VI to move the motor and take measurements.

Andy Webster replaced the MEBT Wire Scanner interface tube that would not hold vacuum on WS#5. He then found that the bellows was leaking so he removed the scanner and replaced the bellows. Installed the encoders on the new motors but they have not been installed on the scanners.
We found a shorted wire on both WS#3 and WS#4. WS#3 turned out to be the ferrule in the spring finger was touching the fork. The carbon was removed and the spring was bent slightly to fix the problem. WS#4 had one of the pins on the feed through connector touching the case causing the short. The wiring from the feed through connector to the fork was replaced and the carbon fibers were re-installed. We have installed all of the wire scanners into the MEBT and completed the preliminary interface check out. We completed the noise floor measurements and Wynn has the results recorded in a spreadsheet. The brake control relays are installed and have been tested, all ok. The brakes are now under computer control and are removed during a scan. The limit switches have been tested and are working. The MPS box has been installed in the Wire Scanner rack. Andy is building the cables that connect it to the terminal boards.

Dave Purcell attended the EPICS meeting this week.

LANL beam diagnostics report:

BPM pickups: Fabrication of the remaining DTL BPMs are on hold until we receive the SMA vacuum feedthroughs, which are expected in January. Testing and mapping the SCL pickups will commence soon. The DTL-style pickup for the D-plate has a vacuum leak on the copper-to-stainless transition piece. It has been returned to ISYS in California for repair.

BPM electronics: Members of the diagnostics team traveled to ORNL the week of Nov. 12-15 to assist with the MEBT BPM systems. Work performed included setting up the new timing system to work with the BPM electronics, finishing and installing the new IOC core on one BPM computer, writing DLL code for the PCI RTDL/event link receiver, and planning for a substitute for the Roscoe box that generates the 352.5, 402.5, 755, and 805 MHz LO and CAL signals for the BPM system.

WS actuators: We tested the positioning accuracy of the 3-inch and 6-inch actuators after cycling them over 2000 times. Preliminary data analysis shows that they will meet specifications. Work continues to prepare the actuators for the D-plate. The fork assembly and fork wiring is now complete. Work is in progress to firm up the design of the HEBT beam boxes.

WS electronics: A member of the diagnostics team traveled to ORNL this week to assist with the MEBT WS systems. The prototype Phytron linear driver system has been assembled and is ready for testing. Initial results look promising.

D-plate: The beam stop successfully passed its 200-psi hydrostatic test, its 100-psi helium leak test, and its flow rate test. All beam stop tests are now complete. All water manifold components are now on site and ready to be installed on the D-plate. Work is in progress to wire up the Huntington actuators for the harp signals, and to correct the motor/brake/limit/LVDT wiring on the slit actuators.

Misc: A member of the diagnostics team traveled to ORNL last week to give a presentation at the DOE review.

BNL beam diagnostics report:

General: SNS Ring Diagnostics presentation was completed at the DOE review.

1.5.7.1 BPM: Five 26cm BPMs were delivered to the vacuum group. TI has obsolete components intended for use in the AFE. Replacement parts have been located, and the schematic has been modified to include them. These parts are used in the BCM AFE as well. RF AFE effort continues.

1.5.7.2 IPM: Detailed design of detector and vacuum chamber continues. Detailed design continues on the luminescence profile monitor installation at 10MeV at the Tandem. This effort is driven by RHIC needs, with SNS as the beneficiary. Five Argonne-style detectors have been installed in RHIC for cross-calibration with RHIC and CERN-style detectors/data (as well as with the RHIC IPM).

1.5.7.3 BLM: Efforts continue on the PCB design of the AFE module, MPS comparator module and crate back plane. We have received some of the ordered discrete components. We are also comparing cost and performance of several HV bias solutions, which could be, used system wide. Discussions continue with ORNL to specify cables and connectors. Continue to prepare for the February run at ORNL and addressing details of the PCR a modified ISEG HV power supply is on its way back from the manufacturer for further testing here at BNL.

1.5.7.4 BCM: Work is proceeding on evaluating software changes. Welded the end caps onto the beam pipe of the prototype HEBT BCM. The unit is ready for the assembly. We are looking into hysteresis affects due to the transformer core to determine the affect upon droop calculations

1.5.7.6a Carbon Wire Scanner: Documenting the carbon fiber plating procedure. Submitted a HEBT beam box design to LANL to finalize the design parameters of the custom made beam box. Drawings for the MEBT wire scanner continue being updated to the present configuration.

1.5.7.6b Laser Wire Scanner: Preparations for testing at 750KeV continue